



Boosting Engineering, Science & Technology™

# MDA STEM Outreach Program Review

**BEST Robotics, Inc.**

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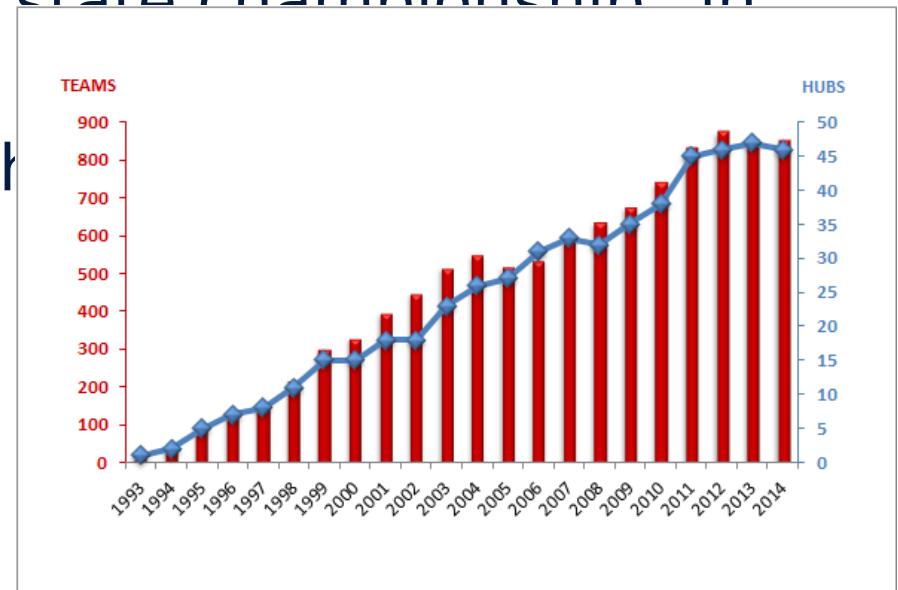




# BEST History

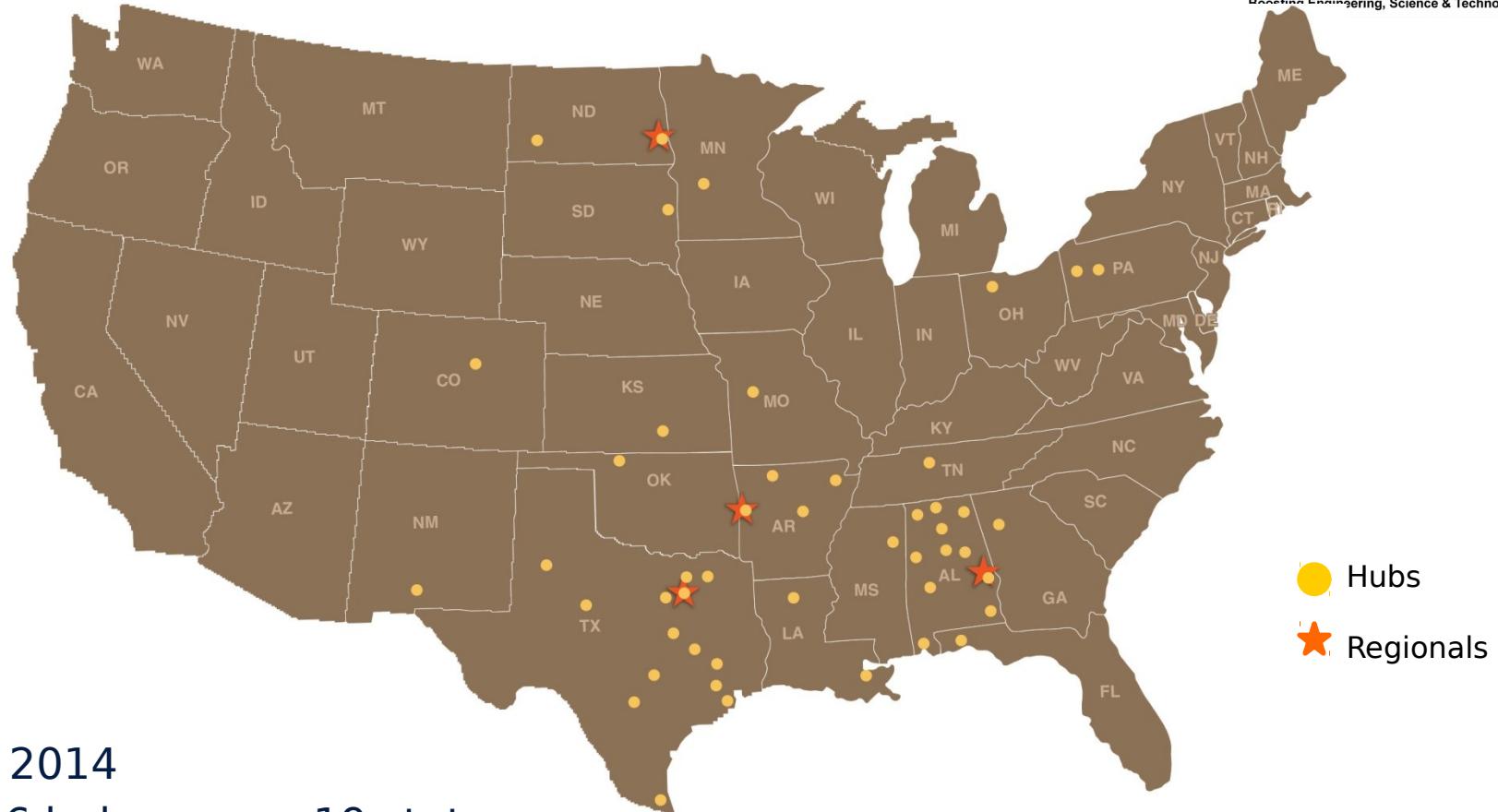


- ◆ Started in 1993 by Steve Marum and Ted Mahler
- ◆ First season had 14 teams, 221 students
- ◆ BEST Robotics, Inc. (BRI) incorporated in 1997 as a 501(c)3
- ◆ Texas BEST started as “state championship” in 1995
- ◆ **1. NATION CHAMPIONSHIP**





# BEST Scope



For 2014

- ◆ 46 hubs across 19 states
- ◆ 837 teams (~18 teams/hub) across 23 states and Canada
- ◆ > 16,000 students
- ◆ Four (4) regional championships



# BEST Program



- ◆ Any school may participate regardless of socio-economic status, size, or location
  - Public, private, charter, and home school groups or organizations
  - Targeted towards middle school and high school students
- ◆ Schools do not pay an entry fee to participate and do not purchase their kits
- ◆ One team per school, but no limit on team size
- ◆ BEST season occurs during the fall semester
- ◆ Annual game theme reflects real-world examples
- ◆ Students are the primary participants and benefactors
  - Student-designed, student-built, student-driven robots
  - Students have the experience, including hands-on manufacturing
- ◆ Mentors from local companies guide the students in the planning and construction of their robot
  - Mentors may not design, build, or compete
  - Mentors are a critical element of a team's success!

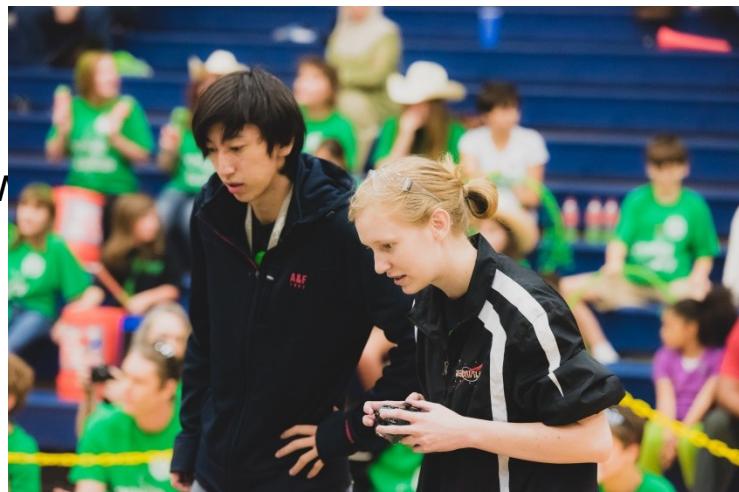




# BEST Divisions



- ◆ BEST Game Competition
  - Based on robot performance for highest total or average scoring during round robin matches and finals
- ◆ BEST Award
  - Given for excellence in the process of building the robot as well as the extent the teams boost engineering, science, and technology within their school and community
    - Project engineering notebook
    - Marketing presentation
    - Conference exhibit and interview
    - Spirit and sportsmanship
    - Robot performance
- ◆ Special Awards



# What BEST Delivers



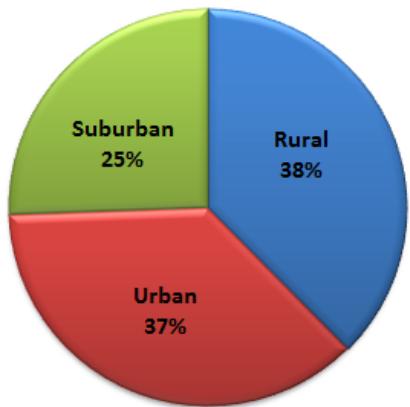
- ♦ BEST is less about building robots and more about teaching students how to analyze and solve problems
  - Simulates real-world constraints with limited time and resources
- ♦ The Engineering Design Process is the fundamental problem-solving tool BEST teachers and mentors use to help guide students through the design-and-construction phase of the program
- ♦ Over 3500 volunteers help run the local competitions and regional championships by serving as event personnel, judges, and team mentors
- ♦ What BEST students learn is what industry needs in its future workforce and what communities need in their future leaders

# BEST Student Benefits

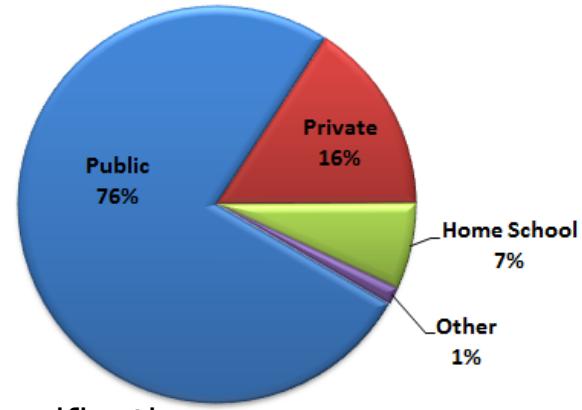


- ◆ Continue interest in STEM-related curriculum
- ◆ Increase understanding of technical concepts and scientific principles
- ◆ Provide real-world science and engineering challenges with limited resources
- ◆ Exposure to the engineering process with constrained time period – engineering is “demystified”
- ◆ Emphasize creative thinking, self-directed learning, and problem solving
- ◆ Experience “design-to-market” product development
- ◆ Promote team building and sportsmanship
- ◆ Receive recognition and acclaim typically reserved for their peers in sports

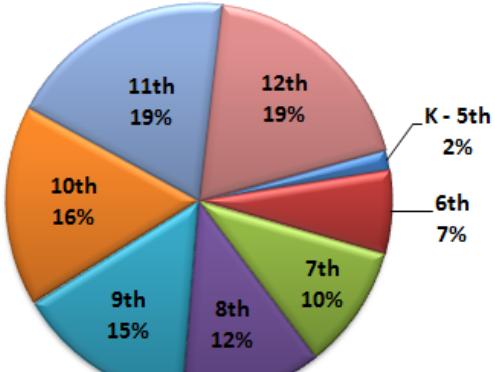
# BRI Team Demographics



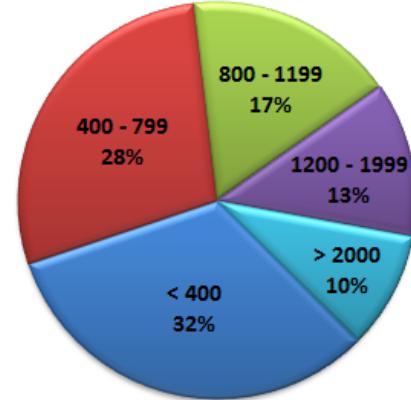
School Location



School Classification



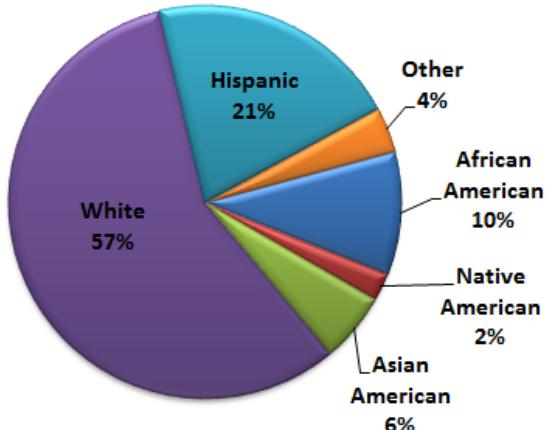
Student Grades



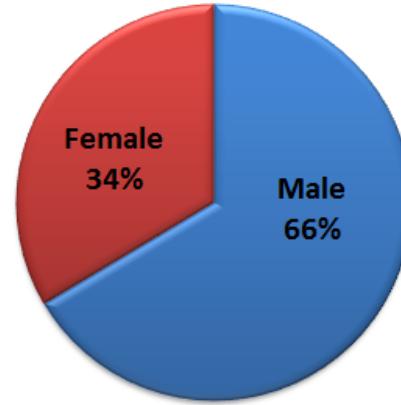
School Size

**2014 data**

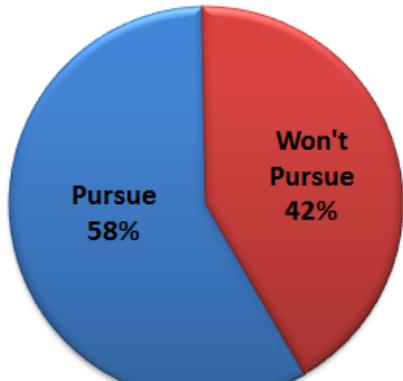
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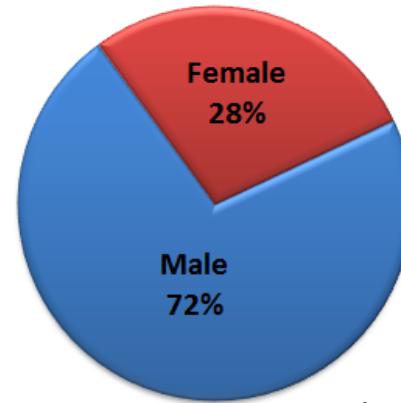
Ethnicity



Gender



Plan to Pursue STEM Career, All Participants  
**2014 data**



Pursue STEM Career, By Gender



# What is BEST?



**The excitement of a basketball game!**  
**The challenge of a science fair!**  
**The strategy of a chess match!**  
**The pressure of a sporting event!**  
**THIS IS BEST!!**



**BEST gives students what they need in the context of what they want!**

# BACKUP

# BEST National Sponsors





# BEST Expenses



- ♦ Each hub and regional championship financially self-supporting
  - Operated totally by volunteers
  - No paid staff so all funding goes towards students
  - Sponsor-provided funding covers
    - Equipment (“Returnables Kit”) and raw materials (“Consumables Kit”)
    - Competition venue rental and insurance
    - Materials to construct game field
  - Hub Funding Requirements
    - About \$1000 per team annually provides kits and competition
    - Each hub sponsors ~19 teams on average, 20 students per team
  - Regional Championship Funding Requirements
    - ~\$50K annually provides competition
    - About 20% of the top hub teams advance to regional championships
- ♦ **Annual cost < \$100 per student**